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Wikiwijs: An unexpected journey and the lessons learned towards OER

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Abstract

The Dutch Ministry of Education, Culture and Science has funded a five years program to encourage the use, creation and sharing of Open Educational Resources (OER) by teachers from various types of education. This program is known as Wikiwijs. Ultimo 2013, the program has come to an end. As some of the assumptions at the start of Wikiwijs proved to work out in unexpected ways the lessons learned could fuel the next steps in developing Wikiwijs. Besides, other national initiatives on *opening up education*¹ may also benefit from the lessons learned reported here.

The main conclusion from five years Wikiwijs was that to accomplish mainstreaming OER, the Wikiwijs program should go along with other interventions that are more oriented toward prescriptive policies and regulations. In particular: the Dutch government should be more directive in persuading executive boards and teachers on schools to adopt OER as an important part of educational reform and the acquisition of 21st century skills.

Keywords: Wikiwijs; Open Educational Resources; OER; Open education; OER policy; repository

Introduction

The Wikiwijs program was launched early 2009 by the Dutch ministry of Education, Culture and Science to encourage respectively using Open Educational Resources (OER), creating OER, and sharing OER by teachers in every sector of education (Plasterk, 2009; Schuwer & Mulder, 2010). In other words, the Wikiwijs program should be useful for primary education as well as for higher education. In this article, the Wikiwijs program is shortly noted as Wikiwijs and the three behaviors (i.e., using, creating, and sharing) are collectively referred to as adopting OER.

The following definition of OER was used in Wikiwijs:

OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge (Atkins, Seely Brown & Hammond, 2007, p. 4).

The Wikiwijs program was implemented by the Open Universiteit of the Netherlands and Kennisnet, the public (semi-governmental) organization aimed to support and inspire Dutch primary and secondary education and vocational institutions in the innovative use of ICT (See <http://www.kennisnet.nl/over-ons/international-visitors>). The authors of this article were involved as project leaders or as members responsible for content related issues and research activities.

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Worldwide, Wikiwijs was the first national program aiming at mainstreaming OER for all sectors and levels of education (Schuwer, 2013). Other previous approaches had limitations; the OER initiatives in Brazil, for example, focused on only the professionalization of teachers (Inamorato dos Santos, 2011) and the Open Book Project in the USA was limiting OER to only the Arab language (see: <http://www.state.gov/p/nea/openbook>).

Because the program was planned for the duration of five years, ultimo 2013 it has come to an end. Looking back at these five years, many challenges have crossed the path. Some of those were dealt with success, other still remain. Also, many results and lessons learned can be taken away. The most visible aspect of Wikiwijs, the portal of the Wikiwijs repository (i.e., the Wikiwijs website <http://www.wikiwijsleermiddelenplein.nl>) with access to over 635,000 OERs, will be continued and continuously improved by Kennisnet.

In this article we share some of our experiences on Wikiwijs and the lessons we learned. In order to explain why things went wrong or went in unexpected directions, we used the PRECEDE—PROCEED model (Green & Kreuter, 2005), the Reasoned Action Approach -RAA- (Fishbein & Ajzen, 2010), and Self Determination Theory -SDT- (Deci & Ryan, 2000). Using these models and theories we got a better insight in the problems that raised during the Wikiwijs project and a better understanding of the lessons learned. Whilst some of the problems could have been foreseen, other problems were unpredictable at the time the Wikiwijs project started.

This article starts with a description of the Wikiwijs program, its aims and strategies to encourage the adoption of OER. The article proceeds with the theoretical framework and presents the three models and theories: PRECEDE—PROCEED, RAA, and SDT. We discuss them briefly as this article is not presenting an empirical study but it is providing some insights in those factors that might have caused the problems. These problems form the next topic and the lessons learned from it. The article ends with a conclusion and discussion, and some recommendations.

The Wikiwijs Program

The Wikiwijs program has the vision of improving the quality and accessibility of education by means of OER. In that regard, the aim of Wikiwijs is to encourage the adoption (i.e., using, creating, and sharing) of OER by teachers. Activities in the program addressed both creating awareness on OER to both teachers and policy makers in educational institutions and the provision of support for using, creating and sharing OER.

To this end the Wikiwijs program has formulated a number of principles:

- The first principle was that whilst Wikiwijs has its own repository with OER it should also act as a referatory to other OER collections. This principle would make Wikiwijs a “one stop shop” for teachers searching for OER.
- The second principle entailed that all OER must be open and accessible (otherwise it wouldn’t be OER). The Creative Commons license model was chosen to regulate this openness and accessibility of OER. OER shared in the Wikiwijs repository was published with either a CC BY (reuse with the obligation to attribute the original author) or a CC BY-SA license (reuse with the obligation to attribute the author and to use the same open license when republishing); the license type was determined by the author of the OER. OER for which Wikiwijs was a referatory were outside of the influence of the Wikiwijs program. Therefore, Wikiwijs could not prescribe the license to be used for these OER.
- The third principle meant that Wikiwijs would not pay for the development of content or redeem rights for content from third parties to publish them as OER, because it would otherwise be considered as potentially disruptive for the commercial publishers.

- The fourth principle prescribed that all learning materials would be adequately described using meta-data in accordance with a standard for the Netherlands.
- The fifth and final principle was to provide sources for self-study for teachers to improve their knowledge and competences in creating and using digital learning materials.

State of Affairs after five years Wikiwijs

In 2013, 3277 remixes were made using the Wikiwijs remix tool. A remix consists of a combination of several learning materials, thus yielding a new learning material. Of these remixes, 1229 (38%) were shared with the world. The remaining remixes were shared in a closed environment (e.g., they were only shared with colleagues or trusted parties). Ultimo 2013, 9786 users of Wikiwijs had created an active profile (meaning that at least one adaptation was made to this profile by the user). In 2013, the number of downloads, uses of shared remixes within Wikiwijs and uses of references to external OER collections for which Wikiwijs was a referatory totaled to over 1M. In 2013, the site had about 200K visits. Teachers differentiated between two types of OER: OER comprising lessons or courses and OER that were half products and, thus, where some rework or remix has yet to be done (e.g., a pedagogy or an assignment has to be added). Ultimo 2013, 11,000 lessons and courses were shared using the Wikiwijs repository and over 70,000 referrals to lessons and courses. The total number of OER was over 635,000.

Theoretical framework

To understand the lessons learned, discussed in the next section, the PRECEDE—PROCEED model of Green and Kreuter (2005) is used. Whilst this model is very well known in the domain of health education and health prevention, the model is fairly unknown in the OER domain. Yet we believe that this model is quite applicable to our OER domain so to develop interventions that encourage the use of OER by teachers. The *PRECEDE—PROCEED model* was used in conjunction with two other theories, namely the *Reasoned Action Approach* of Fishbein and Ajzen (2010) and *Self Determination Theory* of Deci and Ryan (2000). We describe each of these models and theories shortly.

The PRECEDE—PROCEED model

The PRECEDE—PROCEED model has two components that should be considered. The first component is the “educational diagnosis” PRECEDE; the acronym stands for “Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation.” The second component is the “ecological diagnosis” PROCEED; this acronym stands for “Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development.” These two components represent respectively the individual, the social and environmental factors that influence teachers’ behavior to adopt OER.

In PRECEDE, the predisposing factors encompass the individual’s or population’s values and beliefs, attitudes, self-efficacy, perceived norm, descriptive norm, knowledge and skills, intention, awareness, etc. Reinforcing factors are strengthening the intention to perform certain behaviors because the behaviors are positively evaluated by others or because of the feedback given by them or the confirmation that the performed behaviors do satisfy expected behaviors. Enabling factors are those affordances of the environment that make it possible that certain behaviors can be performed. They refer to the financial, technical, and the organizational resources that can be utilized to perform the desired behaviors (i.e., using, creating, and sharing OER). A lack of these enabling factors may inhibit the performance of the desired behaviors.

In PROCEED policies, regulations and organizations should help to realize the adoption of OER by teachers. PROCEED, thus, pays attention to the implementations aspects of an intervention that should encourage the adoption of OER. This holds that care should be taken for involving all potential stakeholders, that policies are formulated by the government which, in turn, require the formulation of regulations to ensure that these policies become maintained. An organization should be setup to be responsible for the implementation of the intervention (i.e. the Wikiwijs program) and the deployment of it.

Reasoned Action approach (RAA)

Central in RAA (Fishbein & Ajzen, 2010) is *intention*. Intention is a predictor of the actual adoption of OER by teachers and is itself predicted by teachers' attitude toward the adoption of OER, perceived norm to adopt OER, and perceived behavior control regarding the adoption of OER.

Teachers' attitude can be defined as the overall feeling of sympathy or antipathy towards the consequences when adopting OER or when using the Wikiwijs repository or a Wikiwijs tool. Perceived norm is a form of social influence which is pressuring (Ajzen 1991; Fishbein & Ajzen 2010) and can be defined as a person's aggregated belief that most people who are considered important (e.g., the school director, colleagues) think that he or she should adopt OER, the Wikiwijs repository or a Wikiwijs tool.

Perceived behavior control or self-efficacy refers to "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1991, p. 257). Self-efficacy, in other words is about the convictions a teacher has in actually adopting OER and his/her ability to overcome the impediments that hinder the adoption of OER.

Self-Determination Theory (SDT)

SDT (Deci & Ryan, 2000) purport that the satisfaction of three psychological needs, namely competence, relatedness and autonomy, are innate conditions for teachers' motivation to adopt OER, the Wikiwijs repository or Wikiwijs tools. As a consequence of the striving to satisfy these needs the motivation will be controlled versus self-determined or intrinsic.

Intrinsic motivation refers to the state of fun and pleasantness one expects. Controlled motivation means that the motivation is external and in its most extreme manifestation one is forced to perform a certain behavior; the latter is referred to as extrinsic motivation. With respect to the basic needs, autonomy refers to the need of self-regulation regarding the adoption of OER. The concept is generally described by Deci and Ryan (2000) as "the organismic desire to self-organize experience and behaviour and to have activity be concordant with one's integrated sense of self" (p. 231). It is the feeling that one is the origin of one's action.

Competence, according to Ryan and Deci (2004) is the feeling that one is effective (in adopting OER), and that there are sufficient opportunities to demonstrate efficacy. Relatedness is the feeling that one is connected and valued by others and that one experiences a sense of belonging with respect to the adoption of OER.

RAA and SDT are models that show the theoretical relationships between all the variables, the PRECEDE—PROCEED model is more an approach for developing and planning interventions based on the insights that emerged from RAA and SDT (or from any other theory) and as such, does have phases and procedures. Also, the PRECEDE—PROCEED model helps policy makers to formulate the policies and strategies that encourage the adoption of OER and to create an organizational structure that support and evaluate teachers' OER adoption.

Past research on the use of ICT by teachers has shown that teachers are generally reluctant to use ICT in their pedagogical practices (Becta, 2010). Indeed Ward (2005) pointed out that professional development of teachers regarding the educational use of ICT and the availability of a high tech ICT infrastructure in schools does not mean that teachers are going to use ICT. This may also be the case for OER. Or, in other words, the availability of high quality OER or the availability of sophisticated tools to create OER and to share OER does not necessarily implicate that teachers will adopt OER. Other factors may play an important role in the decision process of the teachers whether or not adopt OER.

Kreijns *et al.* (2013) suggested that psychological dispositions such as attitudes towards using, creating and sharing OER, and task and environmental factors such as the school and even the regulations of the Ministry may determine teachers' intentions, and consequently teachers' behavior. In addition, motivational factors may play a role in the teachers' decision processes. Kreijns *et al.* (2014) demonstrated that self-determined motivation was affecting teachers' attitudes and, therefore, teachers' intentions to use OER.

Problems and Lessons Learned

Lesson One: Quality is important

It was assumed that all OER entered into the Wikiwijs repository have an acceptable degree of quality. This turned out not to be true. Teachers were complaining that some of the OER they accessed through the Wikiwijs repository were beneath standards. Teachers, therefore, tend not to visit the Wikiwijs repository anymore when they too often find OER that do not meet the quality they want. Besides, the image of Wikiwijs was becoming to be damaged.

The Reasoned Action Approach does predict that quality of OER in terms of perceived usefulness and perceived usability (i.e., ease-of-use) determine teachers' attitudes towards OER which in turn directly influence intention to use OER. If these attitudes are very negative, then it does not matter whether or not teachers have high levels of perceived behavior control or that they perceive social pressure to use them. Many studies either using RAA (or a "stripped down" version of it known as the Technology Acceptance Model; see Davis, 1986) have shown how important quality is and how it affects attitudes and intentions (e.g., Adeyemo, Adedola & Adedola, 2013). From these two frameworks it is "logical" that teachers won't visit the Wikiwijs repository when the quality of OER is questionable.

It was also assumed that it was completely unnecessary to have any quality assurance system, because Wikiwijs assumed a self-regulatory system on quality having teachers as owners; a teacher would know best what quality he or she need. During the program, however, it turned out that teachers needed some yardstick on quality to use for their own OER. Wikiwijs therefore defined a minimum quality model (Schuwer, 2012). This minimum quality model addressed the types of errors that were most reported by users of Wikiwijs by defining quality criteria for each type of error. The quality criteria were categorized in two classes: must-haves and nice-to-haves. Table 1 lists the criteria encompassed by the minimum quality model.

Also, a system of quality marks was established. Each organization or group that can judge on the quality of OER is allowed to act as an issuer of quality marks. These organizations or groups actively search for OER available in the Wikiwijs repository and judge if these OER comply with their quality standards. If this is the case an icon representing the quality mark marks the material. The introduction of quality marks potentially makes quality of OER measurable and transparent.

Finally, it was taken for granted that teachers as users from OER would improve OER that do not meet the quality standards. Based upon our current experiences with Wikiwijs OER, we have no

Table 1: Criteria encompassed by the minimum quality model

#	<i>criterium</i>	<i>description of the criterium</i>
Category 1: Must have		
1.1	No spelling errors	A maximum of three spelling errors is allowed in a sample of 100 words
1.2	Good contrast (in webpages)	It should be easy to read the text off the screen
1.3	Playable on a regular PC or Mac	No installation of extra tools is needed to be able to use OER
1.4	No <i>dead</i> links	No <i>dead</i> link is allowed in a sample of 10 links. If any <i>dead</i> link is discovered then this disqualifies the OER
1.5	Correct meta-data	The meta-data values should be correct for all relevant fields that describe the OER
1.6	Copyright cleared	The OER should have obtained sufficient permissions to use it
1.7	Not outdated	The OER should be up to date
Category 2: Nice to have		
2.1	Grammatically correct sentences	A maximum of five grammatical errors is allowed in a sample of 100 words. Note: grammatical errors do not include spellings errors
2.2	Correct punctuation	A maximum of five clear punctuation errors is allowed in a sample of 10 sentences. Examples of a clear punctuation error are a missing period at the end of a sentence or no capital letter at the beginning of a sentence.
2.3	Presence of a table of contents	A table of contents is preferable for OER that contain large pieces of text
2.4	Presence of learning objectives	The learning objectives for OER containing a lesson or series of lessons should be defined
2.5	Presence of required pre-knowledge	If OER require pre-knowledge than this pre-knowledge should be exactly described
2.6	Inclusion of references	The OER should include references when external material is used or cited

indications that this assumption will prove to become true. To support this observation with empirical data, we currently are administering a questionnaire that addresses this issue.

Summarized: the lessons learned is that we must not underestimate the role that quality of OER have in the usage of OER and Wikiwijs. In addition, we may not assume that all Wikiwijs OER have acceptable quality thereby removing the necessity to have some form of quality assurance. These lessons learned are in accordance with the research described in (Atenas, Havemann & Priego, 2014).

Lesson Two: Creating OER is a collective activity

Initially, it was assumed that teachers would create OER on their own. The tools offered by Wikiwijs to create OER was, therefore, oriented towards the individual teacher. However, it slowly became

clear that most of the OER was created by a group of teachers within one institution or dispersed among different institutions. This observation has led to the provision of tools that permit teachers to collaborate with each other. Because these tools more matched the needs of the teachers it was observed that the number of OER contributions was increasing.

From the RAA framework this increase can be fully explained. Because first the supporting tools for creating OER were completely oriented towards the individual teacher these tools were perceived as less useful when teachers wish to create OER with other teachers. Teachers' attitudes toward tool use were low and hindering the creation of OER. As a result, the growth of new OER in the Wikiwijs repository underperformed expectations. Adapting these tools with support for the collective creation of OER did change teachers' attitude towards the tools and teachers felt more efficacious to create OER with these adapted tools. Besides, from SDT it can be argued that creating OER with other teachers is strengthening the interpersonal relationships between them and may possibly reinforcing feelings of competence. Also, these teachers may be completely autonomous in selecting which OER and how much is created. According to SDT feelings of relatedness, competence and autonomy contribute to feelings of intrinsic motivation to create OER.

Summarized: the lesson learned is that teachers do not create OER on their own but with other teachers. Accordingly they need tools that support this collective activity and that bring teachers together.

Lesson Three: Creating OER is a complex task

Creating OER is to be understood from a series of activities that possibly could be performed by teachers. Creating OER means that teachers may:

1. start from scratch and develop their own OER
2. collect existing OER and perhaps also their own OER with the purpose to remix them into new OER
3. use existing OER and perform minimum alterations so that these OER better suit the needs of teachers.

Irrespective of how OER is created or remixed, it is a complex task for teachers. To support teachers in creating/remixing OER, the Wikiwijs repository includes a remix tool supporting the situations 2 and 3. Teachers creating OER from scratch use their own tools, so there seemed no need for Wikiwijs to support this. However, there were problems with the use of the provided remix tool that ranged from missing functions to hang-ups of the tools. Not surprisingly, teachers were complaining.

To remedy this problem, Wikiwijs conducted some usability studies in labs that gave insights where precisely teachers were struggling with the remix tool. This has led to the improvement of the remix supporting functions. Besides, the usability studies also gave insights into how teachers were experiencing the navigation and the search engine of the Wikiwijs website that give access to the Wikiwijs repository. According to RAA and TAM, it could be expected that the improved Wikiwijs remix tool will lead to a positive acceptance of it and, therefore, an increase of new OER. The statistics of Wikiwijs showed indeed an increase in number of shared remixes over 2013 from 1237 to 2466.

Due to the complex nature of creation and remixing OER, teachers' self-efficacy to create or remix OER can be low and, thus, they need the knowledge and skills of how to make OER both technically and didactically. According to the RAA framework, an increase of competence will increase their self-efficacy for creating and remixing in the future. Besides, an increase of competence will lead to a more positive attitude on using Wikiwijs. Wikiwijs responded to this with providing many

sources that teachers could use to professionalize themselves in creating and using digital learning materials. To support them in using the Wikiwijs platform, a train the trainer program was set up. At the end of 2013, about 1800 teachers had finished this program.

Summarized: the lessons learned here is that underestimating the complexity of creating and remixing OER will cause demotivation of teachers to create and remix OER. They need carefully designed easy to use remix tools. They also need a series of training sessions for acquiring the competences to create and remix OER technically and didactically. However as is warned for in the introduction, the availability of good ICT tools such as the Wikiwijs remix tool and specific professional development programs regarding creating/remixing OER does not imply that teachers will suddenly create and remix OER, though both conditions must be satisfied.

Lesson Four: Sharing OER has to be encouraged and should be made easy

Sharing OER means that these OER are made available for various groups of people. Data from a questionnaire administered in February-March 2013 with 1228 respondents showed that 64.5% of the respondents wished to share some of their OER with trusted colleagues within the same department/section and only 2.9% wished to share them with the broad public (i.e. the “world”) (Van Buuren *et al.*, 2013). Consequently, sharing happened most often through the electronic learning environment of the school or via email. Teachers have several beliefs that prevent them from sharing. Most notably is the belief that when they share they will lose control over their OER and that other people can modify their OER at will, which is something that they want to avoid. It is further suggested that teachers believe that their OER is only useful for their colleagues and that they do not trust the quality of their own OER for sharing them with the broad public. These beliefs drive the forming of a low to moderate attitude towards sharing OER with the broad public and a moderate to high attitude toward sharing OER with trusted people.

An important hindrance to share OER is the condition that for sharing OER teachers have to add meta-data to their OER before they can upload them. NL-LOM, the Dutch standard derived from the standard Learning Object Metadata LOM was adopted by Wikiwijs for this purpose.² The Wikiwijs upload functionality contains an NL-LOM template with fields to fill in specific keywords that specifies the NL-LOM attributes such as the title, the target school level, etc.

Filling in the meta-data, however, was felt as a heavy burden. Teachers have difficulties to understand what they were doing, how they should do it and why it is necessary to fill in all the mandatory fields. These difficulties translated into the issue that teacher were completely unacquainted with the concept of meta-data and its role when classifying OER and in finding OER via search engines such as the built-in search engine of the Wikiwijs repository.

As a result, teachers developed a negative attitude towards filling in meta-data and they feel less efficacious to fill in the meta-data template. The RAA framework predicts that for these reasons it is less likely that teachers will share their OER despite that they may have a positive attitude towards sharing their OER in general. In other words, teachers may want to share their OER but not when they have to fill in meta-data and certainly not when the meta-data template is not helping them to finish this task. The latter refers to the perceived usefulness and perceived ease to use of the meta-data template.

It is to stress here that perceived usefulness and perceived ease to use are important variables in the decision process of teachers whether to use this meta-data template or not which in turn will impact the sharing of OER. From the SDT perspective, a lack of competence to use the meta-data template will decrease self-determined motivation to use this template. To address this, Wikiwijs created an upload service to support teachers in adding meta-data to OER, thereby decreasing the

burden for teachers of sharing OER. During the program several thousands of OER were uploaded using this service.

Summarized: here the lesson learned is that we assumed that teachers are willing to fill in the meta-data, are competent to do so and know why it is important to have meta-data. It is hoped for that in the future this task will be accomplished by fully automated tools.

Lesson Five: One interface does not fit all

Initially, Wikiwijs had one user interface for all sectors of education. This design was selected because of the aim that teachers would be able to search for and access OER independent of the educational organization they are working from. For example, the demand for continuous learning paths crossing educational sectors would benefit by this. It appeared, however, that the demands from the educational sector for a user interface were very different. For example, teachers from primary education wanted a bright, playful user interface whereas teachers from higher education wanted a more sophisticated user interface. Furthermore, teachers from higher education expressed a hesitation to share their OER through the same interface where teachers from primary education were also sharing. The current front-end now offers for each educational sector a bespoke user interface. However, it remains unclear whether these bespoke user interfaces is causing a higher adoption rate of OER by teachers, so future research should investigate this issue.

Summarized: Assuming that one interface would serve the needs of all educational sectors turned out to be wrong. A user requirements phase should have taken place before a user interface is to be designed and implemented. Such user requirements phase would have shown that different educational sectors need different user interphases.

Lesson Six: Existing OER communities do not join voluntary in Wikiwijs

Wikiwijs is dependent on a vibrant community of teachers. They should create, remix, and share OER. Therewithal, it was expected that teachers would improve shared OER by writing reviews on their usefulness and by adding to the meta-data. Wikiwijs had decided not to start a new community, but to seek close cooperation with an already existing community with similar aspirations. This community had their own repository with learning materials that they shared within the community. Initially, connecting to this community with Wikiwijs was a hard case as they wanted to protect their work and autonomy. But, in the end Wikiwijs had managed that this existing community has removed their doubts and objections to cooperate with Wikiwijs.

A short overview of what has happened is listed here:

- the existing community owners and members were all teachers whereas the project members of Wikiwijs were not. Therefore, there was considerable opposition to the “outsiders” who told them that they have to participate. Adding an experienced teacher to the Wikiwijs team to act as an intermediary between the existing community and Wikiwijs caused that eventually the resistance diminished. This is in accordance with (Gollwitzer, 1999) who stated that the use of peers to communicate persuasive messages is highly recommended.
- in the existing community certain ideas existed on how to extend functionalities of their repository. Wikiwijs adopted these ideas to improve the functionality of the Wikiwijs repository thereby making the members of the community more enthusiastic about Wikiwijs and increase their willingness to cooperate with Wikiwijs.
- the existing community was funded by Kennisnet, one of the parties that implemented Wikiwijs. During the program the conditions for the budgets became stricter and target driven. Cooperation with Wikiwijs made it easier for this existing community to fulfill the targets.

Summarized: The lesson learned here is that we may not assume that existing communities would surrender without resistance to Wikiwijs just because we need them. A combination of strategies is needed. In fact, it is an intervention in its own right to help the existing community cross the line. Here the intervention was by using an experienced teacher as an intermediary, adopting the good ideas about improving a repository, and by the mild treat that otherwise cuts in budgets would be expected if they won't cooperate.

Lesson Seven: Governmental policies and regulations are needed

For both school management and teachers, adopting OER is not a natural thing to do. We have the following observations. First, it is remarkable that less than 48% of the teachers did know about the existence of Wikiwijs and from these only 65% have once visited the Wikiwijs repository. Furthermore, the majority of the teachers (78%) reported to use OER that was found on the Internet using search engines (e.g. Google) and less than 18% of the teachers reported that the OER was found in the Wikiwijs repository (van Buuren *et al.*, 2013). Third, teachers felt no social pressure at all to use OER whatsoever (Kreijns *et al.*, 2013).

According to RAA this means that teachers' intention to use OER in their lessons is mainly determined by their personal motives (i.e. their positive attitude, their intrinsic motivation, and their knowledge and skills to use OER). Regarding the creation and remixing of OER, far less teachers (3.1% of the teachers) were engaged in these activities. This can be partly explained by the lack of support given by the school management: 9% of the teachers reported that they were facilitated by their school (van Buuren *et al.*, 2013).

The PRECEDE—PROCEED model points out that interventions can only be effective when the intervention includes all stakeholders that in some way can influence the adoption of OER. The government should involve parties that can exert influence on school management, headmasters, and teachers. All should participate together and this forms one of the critical factors. For the case of the Netherlands, starting only the Wikiwijs initiative was not sufficient to reach the goals which the Ministry had set in realizing mainstreaming OER. More prescriptive policies and regulations are also needed to avoid the current situation where no sense of urgency is felt by both management and teachers to adopt an OER policy.

Summarized: When interventions aims to change the behavior of individuals more is needed than just facilitating an infrastructure (i.e. the Wikiwijs repository) and professional development regarding the adoption of OER (i.e. the teacher training sessions). Again, these are necessary conditions but satisfying these conditions does not mean that teachers start adopting OER. The PRECEDE—PROCEED models clearly pointed to the gaps in the Wikiwijs program, most notably, the weak governmental policies and associated facilitations and regulations that are needed to complement the Wikiwijs program.

Conclusion and Discussion

The Wikiwijs Program was mainly concerned with creating an infrastructure for OER. To that end the Wikiwijs repository and portal was implemented. Professional development of teachers regarding the adoption of OER (or, broader, digital learning materials) was also part of the program.

However (and in this article it was stated more than once), we must keep in mind that the provision of a sophisticated infrastructure and professional development of teachers regarding the adoption of OER does not imply that teachers actually are going to adopt OER (Ward, 2005). More communication would have been helpful that is aimed to be persuasive in nature to convince

various parties (school management, teachers, and so on) about the benefits and role OER can have regarding educational reform and in acquiring 21st century skills (Voogt & Pareja Roblin, 2010).

The Wikiwijs program also addressed the function that communities may have in the provision of new OER in the Wikiwijs repository. However, connecting to an existing community was difficult to achieve. By taking several strategies this was eventually successfully realized.

But the main point is that the Wikiwijs program by itself was not sufficient to realize the goals set by the government. More prescriptive policies and regulations were also needed to avoid the current state of permissiveness on adopting an OER policy by educational organizations. The PRECEDE—PROCEED model clearly showed these gaps.

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Notes

- ¹ “Opening up Education” is an initiative of the European Commission to promote the availability of OER. See <http://www.openeducationeuropa.eu/nl/initiative>.
- ² Information about NL-LOM can be found on <https://wiki.surfnet.nl/display/nllom/Home>

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